IN THE SPECIFICATION

Please replace the paragraph beginning at page 1, line 6, with the following rewritten paragraph:

~~The present invention relates to a semiconductor laser device having a two-stripe structure, a semiconductor laser module, and an optical fiber amplifier using the semiconductor laser module, and more particularly, to a semiconductor laser device, a semiconductor laser module, and an optical fiber amplifier using the semiconductor laser module that has low degree of polarization, produces little beat noise over a long distance, and exhibit a high power output.~~ The present invention relates to a technology to reduce degree of polarization, produce little beat noise over a long distance, and exhibit a high power output in a semiconductor laser device, a semiconductor laser module, and an optical fiber amplifier.

Please replace the paragraph beginning at page 5, line 9, through page 18, line 2 with the following rewritten paragraphs:~~The semiconductor laser device according to one aspect of the present invention includes a first stripe structure which has at least a first active layer deposited on a part of the area of a semiconductor substrate, and a first electrode disposed on the first active layer, and which emits a first laser beam, a second stripe structure which has at least a second active layer deposited on the rest of the area of the semiconductor substrate, and a second electrode disposed on the second active layer, and which emits a second laser beam, and a non-current-injection area which is formed on a part of the area of the upper surface of the first stripe structure and into which no injection current flows.~~

~~According to the present invention, a semiconductor laser device having a W stripe structure has a non-current-injection area on the upper surface of one of the stripes. Therefore, the lengths of resonators on the two stripes are different effectively. Consequently,~~

~~the oscillation longitudinal mode spacing and the oscillation longitudinal mode wavelength of the first laser beam and the second laser beam differ. As a result, the oscillation longitudinal modes of the two laser beams do not overlap and hence it is possible to reduce the DOP.~~

~~The semiconductor laser device according to another aspect of the present invention further includes a second non-current-injection area formed on a part of the upper surface of the second stripe structure and into which no current flows, the second non-current-injection area having a surface area different from the surface area of the first non-injection area.~~

~~According to the present invention, the surface area of the non-current-injection area in the first stripe and the second stripe differ. Consequently, the oscillation longitudinal mode wavelengths of the laser beams from the two stripe structures are made to differ.~~

~~The semiconductor laser device according to still another aspect of the present invention includes the non-current-injection area formed by disposing the first electrode only on the area excluding the non-current-injection area on the upper surface of the first stripe structure.~~

~~According to the present invention, the non-current-injection area is formed as an area where the electrode is not disposed. Consequently, it is possible to easily form a non-current-injection area.~~

~~The semiconductor laser device according to still another aspect of the present invention further includes a first spacer layer disposed between the first active layer and the first electrode, a second spacer layer disposed between the second active layer and the second electrode, a first diffraction grating which is disposed on a part of the area of the first spacer layer, and which selects a first laser beam including a plurality of oscillation longitudinal modes having a specific center wavelength, and a second diffraction grating which is disposed on a part of the area of the second spacer layer, and which selects a second laser beam including a plurality of oscillation longitudinal modes having a specific center~~

~~wavelength.~~

~~According to the present invention, by providing diffraction gratings, it is possible to select laser beams having a plurality of oscillation longitudinal modes. Further, by providing a non-current-injection area, it is possible to realize laser oscillations in the first stripe structure and the second stripe structure that occur in oscillation longitudinal modes of different wavelengths.~~

~~The semiconductor laser device according to still another aspect of the present invention includes the first diffraction grating that is disposed in an area below the non-current-injection area.~~

~~According to the present invention, the first diffraction grating is disposed in an area below the non-current-injection area. Therefore, there is no flow of current and a resultant variation of refractive index in the first diffraction grating. Consequently, it is possible to reduce the variation of the center wavelength selected by the first diffraction grating.~~

~~The semiconductor laser device according to still another aspect of the present invention includes a first stripe structure which has at least a first active layer deposited on a part of the area of a semiconductor substrate, and a first electrode disposed on the first active layer, and which emits a first laser beam, and a second stripe structure which has at least a second active layer deposited on the rest of the area of the semiconductor substrate, and a second electrode disposed on the second active layer, and which emits a second laser beam. The thermal conduction efficiency between the first active layer and the first electrode differs from the thermal conduction efficiency between the second active layer and the second electrode.~~

~~According to the present invention, the temperature in the first active layer and the temperature in the second active layer are made to differ by varying the thermal conduction efficiency. Consequently, the oscillation longitudinal mode wavelength of the first laser beam~~

~~and the oscillation longitudinal mode wavelength of the second laser beam can be made to differ, so as to suppress the overlapping of the two oscillation longitudinal modes. As a result, it is possible to reduce the DOP.~~

~~The semiconductor laser device according to still another aspect of the present invention further includes a first diffraction grating disposed in the vicinity of the first active layer such that the first laser beam has a plurality of oscillation longitudinal modes with a specific center wavelength, and a second diffraction grating disposed in the vicinity of the second active layer such that the second laser beam has a plurality of oscillation longitudinal modes with a specific center wavelength.~~

~~According to the present invention, by providing diffraction gratings, a first laser beam and a second laser beam each having a specific center wavelength and including a plurality of oscillation longitudinal modes can be emitted. Further, by varying thermal conduction efficiency in the first stripe structure and the second stripe structure, laser oscillations of different oscillation longitudinal mode wavelengths can be realized.~~

~~The semiconductor laser device according to still another aspect of the present invention has the width of the first stripe structure in the lateral direction and the width of the second stripe structure in the lateral direction that differ from each other.~~

~~According to the present invention, the thermal conduction efficiency of the first stripe and the thermal conduction efficiency of the second stripe can be made to differ from each other by making the widths of the stripe structures in the lateral direction different.~~

~~The semiconductor laser device according to still another aspect of the present invention has the distance between the first active layer and the first electrode and the distance between the second active layer and the second electrode that differ from each other.~~

~~According to the present invention, it is possible to make the thermal conduction efficiency of the first stripe different from the thermal conduction efficiency of the second~~

~~stripe by varying the distance between the active layer and the electrode in the first stripe and the second stripe.~~

~~The semiconductor laser device according to still another aspect of the present invention further includes a first clad layer deposited between the first active layer and the first electrode, and a second clad layer deposited between the second active layer and the second electrode, wherein the thickness of the first clad layer and the thickness of the second clad layer are different from each other.~~

~~According to the present invention, the distance between the active layer and the electrode is made to differ in the first stripe and the second stripe by varying the film thickness of the clad layer. Consequently, it is possible to make the thermal conduction efficiency of the first stripe different from the thermal conduction efficiency of the second stripe.~~

~~The semiconductor laser device according to still another aspect of the present invention includes a first stripe structure which has a first active layer deposited on a part of the area of a semiconductor substrate and a first diffraction grating disposed in the vicinity of the first active layer, and which emits a first laser beam having multiple oscillation longitudinal modes with a specific center wavelength, and a second stripe structure which has a second active layer deposited on the rest of the area of the semiconductor substrate and a second diffraction grating disposed in the vicinity of the second active layer, and which emits a second laser beam having multiple oscillation longitudinal modes with a specific center wavelength. The center wavelength selected by the first diffraction grating and the center wavelength selected by the second diffraction grating are different from each other.~~

~~According to the present invention, the structures of the diffraction grating of the first stripe and the second stripe differ. Consequently, it is possible to make the center wavelength selected by the first stripe different from the center wavelength selected by the second stripe.~~

~~The semiconductor laser device according to still another aspect of the present invention includes a period of the first diffraction grating and a period of the second diffraction grating that differ from each other such that the center wavelength selected by the first diffraction grating and the center wavelength selected by the second diffraction grating are different from each other.~~

~~According to the present invention, the period of the diffraction grating in each stripe is made to differ. Consequently, it is possible to vary the center wavelength selected by each stripe.~~

~~The semiconductor laser device according to still another aspect of the present invention includes a first stripe structure which has a first active layer deposited on a part of the area of a semiconductor substrate and a first diffraction grating disposed in the vicinity of the first active layer that selects a first laser beam having multiple oscillation longitudinal modes and a specific center wavelength, and a second stripe structure which has a second active layer deposited on the rest of the area of the semiconductor substrate and a second diffraction grating disposed in the vicinity of the second active layer that selects a second laser beam having multiple oscillation longitudinal modes and a specific center wavelength. A difference between the center wavelength of the first laser beam and the center wavelength of the second laser beam is not less than 0.5 times a wavelength spacing between the adjoining oscillation longitudinal modes of the first laser beam or the second laser beam.~~

~~According to the present invention, the difference between the center wavelength of the first laser beam and the center wavelength of the second laser beam is not less than 0.5 times the wavelength spacing between the adjoining oscillation longitudinal modes of the first laser beam or the second laser beam. Consequently, it is possible to reduce the DOP of the combined light, irrespective of whether the oscillation longitudinal modes of the laser beams emitted from the two stripes overlap or not.~~

~~The semiconductor laser device according to according to still another aspect of the present invention has the difference between the center wavelength of the first laser beam and the center wavelength of the second laser beam which is not less than 1.5 times the wavelength spacing between the adjoining oscillation longitudinal modes of the first laser beam or the second laser beam.~~

~~According to the present invention, the difference between the center wavelength of the first laser beam and the center wavelength of the second laser beam is not less than 1.5 times the wavelength spacing between the adjoining oscillation longitudinal modes of the first laser beam or the second laser beam. Consequently, it is possible to reduce the DOP of the combined light to 10% or lower, irrespective of whether the oscillation longitudinal modes of the laser beams emitted from the two stripes overlap or not.~~

~~The semiconductor laser device according to still another aspect of the present invention has the difference between the center wavelength of the first laser beam and the center wavelength of the second laser beam which is not less than 5 times the wavelength spacing between the adjoining oscillation longitudinal modes of the first laser beam or the second laser beam.~~

~~According to the present invention, the difference between the center wavelength of the first laser beam and the center wavelength of the second laser beam is not less than 5 times the wavelength spacing between the adjoining oscillation longitudinal modes of the first laser beam or the second laser beam. Consequently, it is possible to reduce the DOP of the combined light to 5% or lower, irrespective of whether the oscillation longitudinal modes of the laser beams emitted from the two stripes overlap or not.~~

~~The semiconductor laser device according to still another aspect of the present invention includes a first stripe structure which has a first active layer deposited on a part of the area of a semiconductor substrate and a first diffraction grating that selects a first laser~~

~~beam having multiple oscillation longitudinal modes and a specific center wavelength, and a second stripe structure which has a second active layer deposited on the rest of the area of the semiconductor substrate and a second diffraction grating that selects a second laser beam having multiple oscillation longitudinal modes and a specific center wavelength. A difference between the peak wavelength of the first laser beam and the peak wavelength of the second laser beam is not less than 0.01 nm.~~

~~According to the present invention, the difference between the peak wavelength of the first laser beam and the peak wavelength of the second laser beam is not less than 0.01 nm. Consequently, the overlapping of two oscillation longitudinal modes is suppressed. As a result, it is possible to reduce the DOP.~~

~~The semiconductor laser device according to still another aspect of the present invention includes a first stripe structure which has a first active layer deposited on a part of the area of a semiconductor substrate and a first diffraction grating that selects a first laser beam having multiple oscillation longitudinal modes and a specific center wavelength, and a second stripe structure which has a second active layer deposited on the rest of the area of the semiconductor substrate and a second diffraction grating that selects a second laser beam having multiple oscillation longitudinal modes and a specific center wavelength. A difference between the wavelength of all the oscillation longitudinal modes having intensity not more than 3 dB below a peak power in the first laser beam and the wavelength of all the oscillation longitudinal modes having intensity not more than 3 dB below a peak power in the second laser beam, is not less than 0.01 nm.~~

~~According to the present invention, the difference between two oscillation longitudinal modes above a specific power is not less than 0.01 nm. Consequently, the overlapping of two oscillation longitudinal modes is suppressed. As a result, it is possible to reduce the DOP.~~

~~The semiconductor laser device according to still another aspect of the present invention has the difference not less than 0.1 nm.~~

~~According to the present invention, the difference is not less than 0.1 nm. Consequently, the overlapping of two oscillation longitudinal modes is suppressed. As a result, it is possible to reduce the DOP.~~

~~The semiconductor laser device according to still another aspect of the present invention has an oscillation wavelength spectrum formed by the plurality of oscillation longitudinal modes that belong to the first laser beam and an oscillation wavelength spectrum formed by the plurality of oscillation longitudinal modes that belong to the second laser beam, which do not cross each other in a range in which the intensity difference with respect to the peak power is not more than 3 dB.~~

~~According to the present invention, portions above a specific intensity in the two oscillation wavelength spectrums do not cross each other. Consequently, even if oscillation longitudinal modes overlap, the intensity of these oscillation longitudinal modes is small. As a result, it is possible to reduce the DOP.~~

~~The semiconductor laser device according to still another aspect of the present invention has the center wavelength of the second laser beam lower than the center wavelength of the first laser beam, and a difference between a frequency corresponding to the minimum wavelength of the oscillation longitudinal modes having intensity not more than 10 dB below the peak power in the first laser beam and a frequency corresponding to the maximum wavelength of the oscillation longitudinal modes having intensity not more than 10 dB below the peak power in the second laser beam, which is greater than an electrical frequency band width of an optical transmission system being used.~~

~~According to the present invention, the oscillation longitudinal modes of the first laser beam and the oscillation longitudinal modes of the second laser beam above a specific power~~

~~have a frequency difference not less than a specific value. Consequently, it is possible to suppress the beat noise, or even if the beat noise does occur, it is possible to cause it to occur outside the frequency band of the optical transmission system being used.~~

~~The semiconductor laser module according to still another aspect of the present invention includes a semiconductor laser device according to the present invention, a first lens on which the first laser beam and the second laser beam emitted from the semiconductor laser device are incident, a polarization rotating unit into which only any one of the first laser beam and the second laser beam that have passed through the first lens is incident, and which rotates the polarization plane of the incident laser beam by a predetermined angle, a polarization-combining unit having a first port on which the first laser beam from the first lens or the polarization rotating unit is incident, a second port on which the second laser beam from the polarization rotating unit or the first lens is incident, and a third port from which the first laser beam incident from the first port and the second laser beam incident from the second port are combined and emerge, and an optical fiber which receives the laser beams emerging from the third port of the polarization-combining unit, and which transmits the received laser beams to the outside.~~

~~According to the present invention, the first laser beam and the second laser beam that are emitted from the semiconductor laser device are polarization-combined, and the polarization-combined beam is output to the optical fiber. Therefore, it is possible to emit a laser beam with a reduced DOP.~~

~~The semiconductor module according to still another aspect of the present invention has the first lens that is a single lens which separates the first laser beam and the second laser beam so as to widen a distance between the two laser beams.~~

~~According to the present invention, the single lens is used to separate the first laser beam and the second laser beam so as to widen the distance between the two laser beams, and~~

~~the two laser beams are first separated and then polarization-combined. Consequently, even if the stripes are close to each other, it is possible to easily design and assemble the parts for polarization-combining the two laser beams emitted from these stripes.~~

~~The optical fiber amplifier according to still another aspect of the present invention includes a pump light source which uses a semiconductor laser device or a semiconductor laser module according to the present invention, a coupler that couples a signal light with a pump light, and an amplification optical fiber which amplifies a light by a Raman amplification.~~

~~According to the present invention, the above semiconductor laser device or semiconductor laser module is used. Therefore, it is possible to provide an optical fiber amplifier that is pumped by laser beams with reduced DOP.~~It is an object of the present invention to solve at least the problems in the conventional technology.

The semiconductor laser device according to one aspect of the present invention includes a first stripe structure that has at least a first active layer grown on a first portion of a semiconductor substrate and a first electrode formed on the first active layer, and emits a first laser beam, a second stripe structure that has at least a second active layer grown on a second portion of the semiconductor substrate and a second electrode formed on the second active layer, and emits a second laser beam, and a non-current-injection area that is formed on a portion of an upper surface of the first stripe structure.

The semiconductor laser device according to another aspect of the present invention includes a first stripe structure that has at least a first active layer grown on a first portion of a semiconductor substrate and a first electrode formed on the first active layer, and emits a first laser beam, and a second stripe structure that has at least a second active layer grown on a second portion of the semiconductor substrate and a second electrode formed on the second active layer, and emits a second laser beam. A thermal conduction efficiency between the

first active layer and the first electrode differs from a thermal conduction efficiency between the second active layer and the second electrode.

The semiconductor laser device according to still another aspect of the present invention includes a first active layer grown on a first portion of a semiconductor substrate, a first stripe structure that has a first diffraction grating formed in a vicinity of the first active layer, and emits a first laser beam having a plurality of longitudinal modes with a specific center wavelength, a second active layer grown on a second portion of the semiconductor substrate, and a second stripe structure that has a second diffraction grating formed in a vicinity of the second active layer, and emits a second laser beam having a plurality of longitudinal modes with a specific center wavelength. The center wavelength selected by the first diffraction grating differs from the center wavelength selected by the second diffraction grating.

The semiconductor laser device according to still another aspect of the present invention includes a first stripe structure that has a first active layer grown on a first portion of a semiconductor substrate and a first diffraction grating formed in a vicinity of the first active layer, which selects a first laser beam having a plurality of longitudinal modes with a specific center wavelength, and a second stripe structure that has a second active layer grown on a second portion of the semiconductor substrate and a second diffraction grating formed in a vicinity of the second active layer, which selects a second laser beam having a plurality of longitudinal modes with a specific center wavelength. A difference between the center wavelength of the first laser beam and the center wavelength of the second laser beam is not less than 0.5 times a mode spacing of either of the first laser beam and the second laser beam.

The semiconductor laser device according to still another aspect of the present invention includes a first stripe structure that has a first active layer grown on a first portion of a semiconductor substrate and a first diffraction grating formed in a vicinity of the first

active layer, which selects a first laser beam having a plurality of longitudinal modes with a specific center wavelength, and a second stripe structure that has a second active layer grown on a second portion of the semiconductor substrate and a second diffraction grating formed in a vicinity of the second active layer, which selects a second laser beam having a plurality of longitudinal modes with a specific center wavelength. A difference between a peak wavelength of the first laser beam and a peak wavelength of the second laser beam is not less than 0.01 nanometers.

The semiconductor laser device according to still another aspect of the present invention includes a first stripe structure that has a first active layer grown on a first portion of a semiconductor substrate and a first diffraction grating formed in a vicinity of the first active layer, which selects a first laser beam having a plurality of longitudinal modes with a specific center wavelength, and a second stripe structure that has a second active layer grown on a second portion of the semiconductor substrate and a second diffraction grating formed in a vicinity of the second active layer, which selects a second laser beam having a plurality of longitudinal modes with a specific center wavelength. A difference between wavelengths of all the oscillation longitudinal modes that have a difference of not more than 3 dB with respect to a peak power of the first laser beam and wavelengths of all the oscillation longitudinal modes that have a difference of not more than 3 dB with respect to a peak power of the second laser beam is not less than 0.01 nanometers.

The semiconductor laser module according to still another aspect of the present invention includes a semiconductor laser device according to the present invention, a first lens into which the first laser beam and the second laser beam are incident, a polarization rotating unit into which either of the first laser beam and the second laser beam that have passed through the first lens is incident, and rotates the polarization plane of the incident laser beam by a predetermined angle, a polarization-combining unit which has a first port to which

the first laser beam is incident from either of the first lens and the polarization rotating unit, a second port to which the second laser beam is incident from either of the first lens and the polarization rotating unit, and a third port that combines the first laser beam and the second laser beam, and an optical fiber that receives a laser beam output from the third port of the polarization-combining unit, and transmits the laser beam to outside.

The optical fiber amplifier according to still another aspect of the present invention includes a pump light source that employs a semiconductor laser device according to the present invention or a semiconductor laser module according to the present invention, an optical coupler that couples a signal light with a pump light, and an amplification optical fiber that amplifies a light based on a Raman amplification.

The other objects, features and advantages of the present invention are specifically set forth in or will become apparent from the following detailed descriptions of the invention when read in conjunction with the accompanying drawings.

Please replace the paragraph beginning at page 18 through page 20, line 9, with the following rewritten paragraph:

Fig. 1 is a front cross-section of a semiconductor laser device according to a first embodiment of the present invention; Fig. 2 is a cross-section of the semiconductor laser device shown in Fig. 1 cut along the line A-A; Fig. 3 is a cross-section of the semiconductor laser device shown in Fig. 1 cut along the line B-B; Fig. 4 is a front cross-section of a modification of the semiconductor laser device according to the first embodiment; Fig. 5 is a front cross-section of a semiconductor laser device according to a second embodiment of the present invention; ~~Fig. 6(a)~~Fig. 6A and ~~Fig. 6(b)~~Fig. 6B are cross-sections of the semiconductor laser device shown in Fig. 5 cut along the line A-A and the line B-B, respectively; Fig. 7 shows an oscillation wavelength spectrum and oscillation longitudinal

modes of one center wavelength in the semiconductor laser device shown in Fig. 5; ~~Fig. 8 illustrates~~ Fig. 8A and Fig. 8B illustrate a relation between optical intensity of the oscillation longitudinal mode and a threshold value of an stimulated Brillouin scattering in the cases of single longitudinal mode oscillation and multi-longitudinal mode oscillation, respectively; Fig. 9 is a cross-section of a semiconductor laser device according to a third embodiment of the present invention; Fig. 10 is a cross-section of a semiconductor laser device according to a modification of the third embodiment; ~~Fig. 11(a)~~ Fig. 11A and ~~Fig. 11(b)~~Fig. 11B are side cross-sections of a semiconductor laser device according to a fourth embodiment of the present invention; Fig. 12 is a graph showing the correlation between a center wavelength difference and a degree of polarization; ~~Fig. 13(a)~~Fig. 13A and ~~Fig. 13(b)~~ Fig. 13B illustrate a relation between a center wavelength of a diffraction grating and a wavelength of an oscillation longitudinal mode of peak intensity of each laser beam in the semiconductor laser device according to the fourth embodiment; Fig. 14 illustrates a status of overlapping of oscillation longitudinal modes for a case of a wavelength difference of 0.2 nm; Fig. 15 is oscillation spectrum waveforms of two laser beams in a condition where a wavelength difference is set in such a way that an oscillation longitudinal mode of one laser beam is interleaved between two adjacent oscillation longitudinal modes of the other laser beam; Fig. 16 illustrates a status of two oscillation wavelength spectrums not intersecting each other above a specific intensity; ~~Fig. 17 is a block diagram~~Fig. 17A and Fig. 17B are schematic diagrams of a semiconductor laser beam source; Fig. 18 illustrates oscillation spectral waveforms of two laser beams by which the beat noise frequency range becomes out of the frequency range of an optical transmission system; Fig. 19 is a graph of oscillation spectral waveforms of two laser beams having different center wavelengths by 1.5 nm; Fig. 20 is a graph of RIN measured for a polarization-combined light that has transmitted over a long distance; Fig. 21 is a side cross-section of a semiconductor laser module according to a fifth

embodiment of the present invention; Fig. 22 is a schematic explanatory diagram of the semiconductor laser module according to the fifth embodiment; ~~Fig. 23(b)~~Fig. 23B and ~~Fig. 23(b)~~Fig. 23B are a side view and a plan view of a prism, respectively; ~~Fig. 24(a)~~Fig. 24A, ~~Fig. 24(b)~~Fig. 24B, and ~~Fig. 24(c)~~Fig. 24C are a plan cross-section, a side cross-section, and a front view of a holder supporting a prism a half-wave plate and a polarization-combining unit, respectively, and ~~Fig.24(d)~~Fig. 24B is a perspective view of the holder supported by a second supporting member; Fig. 25 is a block diagram of an optical fiber amplifier according to a sixth embodiment of the present invention; Fig. 26 is a block diagram of a conventional optical fiber amplifier; and Fig. 27 is a graph illustrating a beat noise generated after propagating a long distance according to a conventional technology.

Page 20, line 21, please delete in its entirety.

Page 27, line 16, please delete in its entirety.

Please replace the paragraph beginning at page 28, line 5 with the following rewritten paragraph:

~~Fig. 6(a)~~Fig. 6A is a cross-section of the semiconductor laser device shown in Fig. 5 cut along the line A-A. As shown in this drawing, the semiconductor laser device according to the second embodiment has a structure in which a diffraction grating 23a is disposed in a part of the area within the p-InP spacer layer 17a. ~~Fig. 6(b)~~ Fig. 6B is a cross-section of the semiconductor laser device shown in Fig. 5 cut along the line B-B, which shows that a diffraction grating 23b is disposed in a part of the area within the p-InP spacer layer 17b.

Please replace the paragraph beginning at page 28, line 13 with the following rewritten paragraph:

These diffraction grating 23a and 23b are made of p-InGaAsP. Each diffraction

grating has a film thickness of 20 nm, and a length of 50 μm in a laser emission direction (i.e. the lateral direction in ~~Fig. 6(a)~~Fig. 6A and ~~Fig. 6(b)~~Fig. 6B). Further, each diffraction grating has a single period of 220 nm. The diffraction gratings 23a and 23b being constituted as such, they can select a laser beam that has a plurality of oscillation longitudinal modes having a center wavelength of 1480 nm.

Please replace the paragraph beginning at page 28, line 20 with the following rewritten paragraph:

As shown in ~~Fig. 6(a)~~Fig. 6A, the stripe 18a has a p-side electrode 8a disposed over the whole surface of a p-InGaAsP contact layer 7. As shown in ~~Fig. 6(b)~~Fig. 6B, the stripe 18b has a p-side electrode 8b disposed on a portion on the p-InGaAsP contact layer 7, thereby forming a non-current-injection area 14 on the area on which the p-side electrode 8b is not disposed. A low reflection film is made to have a light reflectivity of not more than 1%, preferably not more than 0.01% so that the effect of reflection of Fabry Perot modes at the emission end surface is suppressed.

Please replace the paragraph beginning at page 30, beginning at line 21, through page 31, line 6 with the following rewritten paragraph:

The use of such laser beam having a plurality of oscillation longitudinal modes makes it possible to obtain a high laser output overall, with the intensity of individual oscillation longitudinal mode being suppressed as compared with the case of a laser beam oscillating in single longitudinal mode. For instance, the semiconductor laser device according to the second embodiment has an oscillation spectrum shown in ~~Fig. 8(b)~~Fig. 8B, where a high laser output is achieved overall with reduced intensity of individual longitudinal mode. On the other hand, ~~Fig. 8(a)~~Fig. 8A shows an oscillation spectrum of a semiconductor laser device

that oscillates in a single longitudinal mode to obtain the same laser output, where the longitudinal mode has a larger intensity.

Please replace the paragraph beginning at page 31, beginning at line 7, with the following rewritten paragraph:

That is, when the semiconductor laser device is used as a pump light source for the Raman amplifier, it is preferable to increase a pumping optical output power in order to increase a Raman gain. However, if the oscillation longitudinal mode is intense, noise is generated to a greater extent through stimulated Brillouin scattering. Since the stimulated Brillouin scattering occurs when the oscillation longitudinal mode intensity exceeds the threshold Pth, Brillouin scattering can be suppressed by including a plurality of oscillation longitudinal modes within the laser beam, while keeping overall laser output, and thereby suppressing the intensity of each oscillation longitudinal mode below the threshold Pth of stimulated Brillouin scattering, as shown in ~~Fig. 8(b)~~Fig. 8B. In this way, a high Raman gain can be obtained.

Page 33, line 16, please delete in its entirety.

Page 37, line 13, please delete in its entirety.

Page 38, line 13, please delete in its entirety.

Please replace the paragraph beginning at page 38, beginning at line 22, through page 39, line 8, with the following rewritten paragraph:

~~Fig. 11(a)~~Fig. 11A and ~~Fig. 11(b)~~Fig. 11B are a side cross-sections that show the

structure of the semiconductor laser device according to the fourth embodiment (the front cross-section is the same as Fig. 5 and hence is omitted). ~~Fig. 11(a)~~Fig. 11A illustrates a stripe 52a that includes a diffraction grating 53a. ~~Fig. 11(b)~~Fig. 11B illustrates a stripe 52b that includes a diffraction grating 53b. The diffraction gratings 53a and 53b have different periods so that the center wavelength selected by the diffraction grating 53a is different from the center wavelength selected by the diffraction grating 53b. In the present embodiment, based on the above structure, it is possible to reduce the DOP of a polarization-combined laser beam, the reason for which is explained below.

Please replace the paragraph beginning at page 42, beginning at line 14, with the following rewritten paragraph:

The conditions that the diffraction gratings 53a and 53b must meet in order to select different center wavelengths will be examined with reference to ~~Fig. 13(a)~~Fig. 13A. ~~Fig. 13(a)~~Fig. 13A illustrates an instance in which the oscillation longitudinal mode of maximum intensity (with peak wavelength λ_{p1}) of the first laser beam is on the short wavelength side with respect to the center wavelength λ_{G1} of the diffraction grating 53a formed in the first stripe structure 52a, and the oscillation longitudinal mode of maximum intensity (with peak wavelength λ_{p2}) of the second laser beam is on the long wavelength side with respect to the center wavelength λ_{G2} of the diffraction grating 53b formed in the second stripe structure 52b.

Please replace the paragraph beginning at page 42, beginning at line 25, through page 43, line 9, with the following rewritten paragraph:

According to the curve l_2 in Fig. 12, a DOP can be reduced at least to 10% or less if the wavelength difference $\Delta\lambda p$ ($=\lambda_{p1}-\lambda_{p2}$) is not less than half of the oscillation longitudinal mode

spacing $\Delta\lambda$ (=0.2 nm) (that is, not less than 0.1nm). Referring to ~~Fig. 13(a)~~Fig. 13A, the difference $\Delta\lambda_G$ ($=\lambda_{G1}-\lambda_{G2}$) between the center wavelengths of the diffraction gratings required for the DOP of the combined light to be 10% or lower irrespective of whether the oscillation longitudinal modes of the laser beams emitted from the two stripes overlap or not, can be calculated as given below:

$$\Delta\lambda_G \geq \Delta\lambda/2 + \Delta\lambda/2 + \Delta\lambda/2 = 1.5\Delta\lambda \qquad (2)$$

Please replace the paragraph beginning at page 43, beginning at line 10, with the following rewritten paragraph:

Similarly, according to the curve l_2 in Fig. 12, a DOP can be reduced at least to 5% or less if the wavelength difference $\Delta\lambda p$ is not less than four times the oscillation longitudinal mode spacing $\Delta\lambda$ (that is, not less than 0.8 nm). Referring to ~~Fig. 13(a)~~Fig. 13A, the difference $\Delta\lambda_G$ between the center wavelengths of the diffraction gratings required for the DOP of the combined light to be 5% or lower irrespective of whether the oscillation longitudinal modes of the laser beams emitted from the two stripes overlap or not, can be calculated as given below:

$$\Delta\lambda_G \geq \Delta\lambda/2 + \Delta\lambda/2 + 4\Delta\lambda = 5\Delta\lambda \qquad (3)$$

Please replace the paragraph beginning at page 43, beginning at line 25, through page 44, line 12, with the following rewritten paragraph:

Further, referring to~~ Fig. 13(a)~~Fig. 13A, the difference $\Delta\lambda_G$ between the center wavelengths can be reduced when the peak wavelength is more or less equal to the center wavelength, that is, when $\lambda_{p1}\approx\lambda_{G1}$ and $\lambda_{p2}\approx\lambda_{G2}$. In this case, the wavelength difference $\Delta\lambda p$ is not less than half of the oscillation longitudinal mode spacing $\Delta\lambda$ when:

$$\Delta\lambda_G \approx \Delta\lambda p \geq \Delta\lambda/2 \qquad (4)$$

If $\Delta\lambda_G$=$\Delta\lambda$p, then $\Delta\lambda_G \geq \Delta\lambda/2$, then according to the curve l_2 in Fig. 12, the DOP reduces to 10% or lower. Even if $\Delta\lambda_G$ and $\Delta\lambda$p are only more or less the same and do not match exactly, the DOP can be reduced to about 10%. In ~~Fig. 13(a)~~Fig. 13A and ~~Fig.13(b)~~Fig. 13B, if the two stripes emit laser beams with different oscillation longitudinal modes, the DOP of the combined light can be reduced by applying any one of oscillation longitudinal mode spacing $\Delta\lambda$ in expressions (2) through (4).

Please replace the paragraph beginning at page 44, beginning at line 13, through page 45, line 12, with the following rewritten paragraph:

Another method for determining the center wavelength of the diffraction grating of each stripe so that the DOP of the combined light can be reduced is to evade overlapping of the oscillation wavelength spectrums 54 and 55 of two laser beams on their portion above a specific power, as shown in Fig. 16. To be more specific, the center wavelength difference of the diffraction gratings ~~$\Delta\lambda p\ (=\lambda_{p1}-\lambda_{p2})$~~$\Delta\lambda_G$ should be set such that the portion of the oscillation wavelength spectrums 54 and 55 having an intensity difference not more than 3 dB with respect to the maximum intensities of the laser beams do not cross each other. In the schematic diagram shown in Fig. 16, even though the oscillation longitudinal mode 56a belonging to the oscillation wavelength spectrum 54 and the oscillation longitudinal mode 57a belonging to the oscillation wavelength spectrum 55 are overlapping, the overlapping is negligible enough to keep DOP from increasing to a large extent, since the difference between the intensity of the oscillation longitudinal mode 57a and the maximum intensity of the laser beam is more than 3 dB. For similar reasons, even though the oscillation longitudinal mode 57b belonging to the oscillation wavelength spectrum 55 and the oscillation longitudinal mode 56b belonging to the oscillation wavelength spectrum 54 are

overlapping. The overlapping has negligible influence on DOP. In order to reduce the DOP further, it is preferable to set the center wavelength difference ~~Δλp~~$\underline{\Delta\lambda_G}$ such that the oscillation wavelength spectrums 54 and 55 do not cross in the range in which the intensity difference with respect to the maximum intensity of the laser beams is not more than10 dB.

Please replace the paragraph beginning at page 45, beginning at line 13, with the following rewritten paragraph:

In this way, it is possible to realize a semiconductor laser device in which the DOP of the polarization-combined laser beam can be effectively reduced, by setting the wavelength difference ~~Δλp~~$\underline{\Delta\lambda_G}$ to be 1.5 times, preferably 5 times, the oscillation longitudinal mode spacing Δλ, or by setting the wavelength difference ~~Δλp~~$\underline{\Delta\lambda_G}$ such that the oscillation wavelength spectrums do not cross in the range in which the intensity ratio to the maximum is not more than a predetermined value, specifically 3 dB, or preferably 10 dB.

Please replace the paragraph beginning at page 45, beginning at line 21, through page 46, with the following rewritten paragraph:

This method of setting the wavelength difference Δλp is not limited to the semiconductor laser beam source formed from a semiconductor laser device having a W stripe structure, but is applicable to the semiconductor laser beam source formed from two separate semiconductor laser devices which has a stripe each on two different substrates. In the latter case as well, the DOP of the polarization-combined beams can be effectively reduced by setting the wavelength difference Δλp as described above. To be more specific, the structures shown in ~~Fig. 17(a)~~<u>Fig. 17A</u> and ~~Fig. 17(b)~~<u>Fig. </u>17B can be used. As shown in Fig. 17(a), an pump light source with reduced DOP can be fabricated by a semiconductor laser beam source 59a that includes two semiconductor laser devices 58a and 58b each

having a single stripe , which have a wavelength difference of $\Delta\lambda p$ in the range described above. The laser beams emitted from the two semiconductor laser devices 58a and 58b are orthogonally polarization-combined by a polarization-combining coupler 60.

Please replace the paragraph beginning at page 46 beginning at line 12, through page 47, with the following rewritten paragraph:

Alternatively, as shown in ~~Fig. 17(b)~~Fig. 17B, laser beams emitted from two single stripe semiconductor laser devices 58a and 58b that form the semiconductor laser beam source 59b can be directed into the polarization-combining coupler (cube beam splitter) 62 in such a way that the two laser beams are orthogonal to each other. The laser beam which is emitted from the single stripe semiconductor laser device 58a and collimated by a lens 61a and the laser beam which is emitted from the single stripe semiconductor laser device 58b, collimated by a lens 61b, and passed through a half-wave plate 61c, are orthogonally polarization-combined by the polarization-combining coupler 62. Thus, a light with reduced DOP is input into a transmission optical fiber 64. In the semiconductor laser beam source shown in ~~Fig. 17(a)~~Fig. 17A and ~~Fig. 17(b)~~Fig. 17B, the two laser beams can be made to have a wavelength difference described above by appropriately adjusting the temperature of each semiconductor laser device.

Please replace the paragraph beginning at page 47 beginning at line 2, with the following rewritten paragraph:

In the semiconductor laser device having a W stripe structure and in the beam source having the single stripe semiconductor laser devices shown in ~~Fig. 17(a)~~Fig. 17A and ~~Fig. 17(b)~~Fig. 17B, the DOP of the combined light can be reduced by setting the wavelength of the two laser beam between the cyclical peak of the DOP shown in Fig. 12 through a fine-

tuning of the wavelength of each laser beam. For instance, according to the trend of the curve l_1 of Fig. 12, the DOP of the combined light can be lowered by making the wavelength difference of the oscillation longitudinal modes of the laser beams emitted from the two semiconductor light sources not less than 0.01 nm, preferably not less than 0.1 nm. Here, the above wavelength difference may be made on all the oscillation longitudinal modes. However, it may be made only on the oscillation longitudinal modes of a specific intensity or higher. This is because the oscillation longitudinal modes of higher intensity contribute more to reducing DOP of the combined light. To be more specific, the DOP of the combined light can be reduced by making the above-described wavelength difference on the oscillation longitudinal modes of intensity ratio not more than 3 dB, preferably not more than 10 dB, to the peak intensity.

Page 50, line 25, please delete in its entirety.

Please replace the paragraph beginning at page 53, line 15, through page 54, with the following rewritten paragraph:

~~Fig. 23(a)~~Fig. 23A is a side view showing a structure of the prism 75, and ~~Fig. 23(b)~~Fig. 23B is a plan view of this prism. As shown in ~~Fig. 23(a)~~Fig. 23A and Fig. 23(b)Fig. 23B, the prism 75 is about 1.0 mm in total length L1, and has a flat input surface 75a and an output surface 75b inclined at a specific angle θ (θ lies in a range 3.2°±0.1°).

Please replace the paragraph beginning at page 54, line 10, with the following rewritten paragraph:

In the present embodiment, the prism 75, the half-wave plate 76, and the polarization beam combiner 77 are fixed to a common holder member 84. ~~Fig. 24(a)~~Fig. 24A is a plan

cross-section showing the holder member 84 supporting the prism 75, the half-wave plate 76, and the polarization beam combiner 77, ~~Fig. 24(b)~~Fig. 24B is a side cross-section of this holder, and Fig. 24(c) is a front view of this holder. As shown in ~~Fig. 24(a)~~Fig. 24A, ~~Fig. 24(b)~~Fig. 24B, and ~~Fig. 24(c)~~Fig. 24C, the holder member 84 is prepared using a material to which YAG laser welding can be applied (for example, SUS403, 304, and the like). The holder member 84 has a total length L2 of about 7.0 mm, and is substantially cylindrical in shape. The holder member 84 has an accommodating section 84a, where the prism 75, the half-wave plate 76, and the polarization beam combiner 77 are fixed. The upper part and lower part of the holder member 84 are flat.

Please replace the paragraph beginning at page 54, line 24, through page 55, with the following rewritten paragraph:

As shown in ~~Fig. 24(d)~~Fig. 24D, the holder member 84 is fixed between two upright walls of a second supporting member 89b having substantially a U-shaped cross-section. The holder member 84 can be disposed between the upright walls, being rotated around a center axis C1. Based on the above structure, the position of the holder member 84a can be easily adjusted along X, Y, and Z axes and around the center axis C1 such that the first laser beam K1 incident on the first port 77a and the second laser beam K2 incident on the second port 77b of the polarization beam combiner 77 emerges from the third port 77c.

Page 59, line 11, please delete in its entirety.

Please add the following new paragraph at page 66, after line 2:

Although the invention has been described with respect to a specific embodiment for a complete and clear disclosure, the appended claims are not to be thus limited but are to be

construed as embodying all modifications and alternative constructions that may occur to one skilled in the art which fairly fall within the basic teaching herein set forth.